DISSERTATION ON

ACTIVE VERSUS EXPECTANT MANAGEMENT IN WOMEN WITH PRETERM PREMATURE RUPTURE OF MEMBRANES BETWEEEN 34 AND 37 WEEKS OF GESTATION

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CERTIFICATE

This is to certify that this dissertation entitled **"ACTIVE VERSUS EXPECTANT MANAGEMENT IN WOMEN WITH PRETERM PREMATURE RUPTURE OF MEMBRANES BETWEEN 34 TO 37 WEEKS OF GESTATION"** submitted by **Dr. GOWRI MANOHARI. S** appearing for Part II M.D. Branch II Obstetrics and Gynaecology Degree examination in March 2010 is a bonafide record of work done by her under my direct guidance and supervision in partial fulfillment of regulations of the Tamil Nadu Dr. M.G.R. Medical University, Chennai. I forward this to the Tamil Nadu Dr.M.G.R. Medical University, Chennai, Tamil Nadu, India.

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INTRODUCTION

INTRODUCTION

Spontaneous rupture of membranes usually coincides with labour. When it precedes onset of labour by a latent interval varying from hours to days and weeks it is termed as premature rupture of membranes (PROM) or, more aptly prelabour rupture of membranes. If it occurs at any time prior to 37 completed weeks of gestation, it is titled preterm premature rupture of membranes (PPROM).

The incidence of PPROM is 3% of all pregnancies and it is responsible for 40% of all preterm deliveries (Parrys S et al). The time interval between the rupture of membranes and onset of labour (latent period) may extend from hours to days. Generally shorter the gestational period, the longer the latent period. In case of PPROM, labour generally sets in within 24 hrs in 25-50% and within 72hrs in 70% patient. The incidence of PPROM varies from

0.5% before 26weeks

1.0% between 26 and 34 weeks

1.5% between 34 and 37 weeks

The incidence of RDS is estimated to decrease from 15% at 34weeks to below 1% at 37 weeks (Lewis et al). On the other hand the probability that sepsis occurs, increases when expectant management is advocated. In

case, the child born immediately after PROM, the risk of sepsis is 2.5%, whereas it increases to 7.5% in case of expectant management (Lieman et al). Preterm PROM is a greater affront to the mother and her fetus compared to term PROM, considering the

problems of maternal infection and fetal prematurity.

The most favourable approach in dealing with preterm premature rupture of membranes at 34 weeks 0 days to 36 weeks 6 days remains controversial. Recent studies suggest that prolonging gestation beyond 34 weeks results in low or no reduction in mortality. Alternatively, it has been suggested that induction of labour after rupture of membranes, particularly in gravid women with an unfavourable cervix may be associated with increased rate of cesarean delivery.

Therefore the obstetrician has to strike a fine balance between conservative approach and induction of labour and the management choice has to be individualized after a complete clinical appraisal. This prospective study is undertaken to investigate difference in maternal and neonatal morbidity associated with active versus expectant management of PPROM at 34 to 37 weeks of gestation.

REVIEW OF LITERATURE

REVIEW OF LITERATURE

DEFINITION

Preterm rupture of membranes is defined as rupture of fetal membranes occurring prior to the onset of labour. Preterm premature rupture of membranes (PPROM) refers to the occurrence of this event prior to 37 weeks of gestation.

INCIDENCE

The incidence of PPROM varies from

0.5% before 26weeks

1.0% between 26 and 34 weeks

1.5% between 34 and 37 weeks

It accounts for about one fourth of all cases of ruptured membranes. PPROM is responsible for close to 40% of preterm births (Parrys S et al).

SIGNIFICANCE

PPROM is associated with significant maternal complications, increase in operative intervention and neonatal morbidity and mortality. Because PPROM is the leading cause of preterm birth and perinatal morbidity, it has a tremendous socio-economic impact in the society.

PATHOPHYSIOLOGY

PPROM is a complex and multifactorial entity. The fetal membranes are composed of the amnion and chorion bound together by different layers composed of extracellular matrix. This matrix is the key factor for the elasticity and tensile strength of fetal membranes. The tensile strength guarantees the role of the membranes as a physical and functional boundary for the fetus during pregnancy (Vadillo-Ontego et al). If the extra cellular matrix is intact, the fetal membrane's elasticity and tensile strength is at its maximum; hence any process that weakens the matrix metalloproteinases (MMPs) increases the risk of PPROM.

Risk factors are

Previous pregnancy with PPROM (21%)

Antepartum haemorrhage

Multiple gestation

Polyhydramnios (excessive membrane distension)

Smoking

Illicit drugs such as heroin and cocaine

Cervical insufficiency

Infection

Prenatal diagnostic procedures like chorionic villus sampling and amniocentesis

Mineral & Vitamin deficiencies

Digital examination

Positive fibrinonectin

Prior cervical surgical procedures

Ehlers –Danlos syndrome.

Placental pathology

Greatest risk factor for PPROM is infection. It has been demonstrated that bacterial proteases decreases the strength and elasticity of chorioamniotic membranes (McGregor JA et al). Women who are infected with Gonorrhea (Edwards LE, Barrada MI, Hammam AE et al), Trichomonas, or Chlamydia (Martin et al), and those infected with Group B hemolytic streptococcus (Regan et al) or Gardenella vaginalis also have an increased risk of PPROM(Minkoff et al). Bacteria which colonize the genital tract have the capability of producing phospholipases which stimulate the release of prostaglandins from the breakdown of arachidonic acid, leading to preterm contractions. Infection also causes a host immune response, releasing pro-inflammatory cytokines and mediators which cause weakening

of the fetal membranes by disrupting its extracellular matrix and releasing MMPs.

MMPs are a family of enzymes with varied substrate specificities that decrease membrane strength by increasing collagen degradation. The activation of MMP-9, a 92-kDa type IV collagenase, as an essential mediator of tissue damage is under investigation.

The local physiological signal by amniochorion cells to induce MMP-9

expression is not known, but bacterial products and/or the pro inflammatory cytokines, IL-1 β and TNF- α, as paracrine or autocrine signals may trigger these processes in pregnancies complicated with intra amniotic infections (VallidoOrtego et al). In 2003, Romero et al described MMP-3 as a physiological constituent of amniotic fluid that may play a role in the mechanism of human parturition and in the regulation of host response to intrauterine infection. Microbial invasion of amniotic cavity in preterm gestation has also been associated with a significant increase in amniotic fluid concentration of MMP-7, playing a role in host defense mechanism. (Maymon E, Romero R, Pacona P et al). Marked elevations of mid trimester amniotic fluid MMP-8 have also been found to be associated with subsequent preterm premature rupture of membranes, suggesting that pathophysiological processes that contribute to preterm premature rupture of membranes may begin early in pregnancy (Biggio Jr JR et al).

Genetic susceptibility may be a risk factor for PPROM. In 2002, the MMP-9 gene promoter activity and its association with PPROM were described. It was concluded that there are cell host-dependent differences in MMP-9 promoter activity. In African- American neonates born from pregnancies complicated with PPROM, the allele associated with the increase in the MMP-9 promoter activity expression was found to be present, compared to those neonates who delivered at term without PPROM (Ferrand PE, Parry S, Sammel M et al).African-American females who are carriers for the SERPINH1 gene T- allele are also at high risk for premature delivery. This T allele reduces the promoter activity in amnion fibroblast that deposit fibrillar collagen which

gives the tensile strength to the amnion (Wang H, Parry S, Macones G et al).

There is evidence implicating that relaxin is a component of the mechanism of membrane rupture. Laboratory experimentation shows that relaxin induces collagenase activity when incubated with membranes in vitro (Qin et al). Also, the relaxin gene is over expressed in the membranes of women with PPROM when compared with those from women in preterm labour with intact membranes or from women not in labour (Bogic et al.,

1997). Other studies have indicated that the relaxin mediated pathway of PPROM is independent of infection (Millar et al., 1998).

EVALUATION OF PPROM

A patient with symptoms suggestive of PPROM should have prompt evaluation. Patient history has a sensitivity of 90% for the diagnosis of PPROM (Rodeck et al).

SPECULUM EXAMINATION

A patient who complains of leakage of fluids should have a speculum examination to evaluate for gross pooling of amniotic fluid in the vagina. If no fluid seen on the speculum examination, the patient should be instructed to perform a valsalva maneuver such as coughing to evaluate if any leakage is visualized from the cervical os. Digital examination should be avoided since this increases the risk of infection and little information is obtained from this examination (Friedman ML et al).

Several tests have been utilized to assist in the diagnosis of PPROM if rupture of membranes cannot be determined by a Speculum examination alone. The nitrazine paper

test and the fern test may be performed. The combination of the patient's history, speculum examination, the nitrazine test, and the fern test for the evaluation of a patient with symptoms suggestive of PPROM yields a sensitivity of 93.1 %(Rodeck et al).

NITRAZINE TEST

The normal pH of the vagina during pregnancy is between 4.5 and 5.0. When rupture of membranes occurs and the vaginal mucosa is bathed in amniotic fluid whose pH is close to 7.3, the pH increases above 6.0, causing the nitrazine paper to turn from yellow to blue in colour. However, the nitrazine test may give false positive results if contaminated with semen, blood, some lubricants, or if a vaginal infection is present. The nitrazine test has 12.7% false negative and 16.2% false positive results.

FERN TEST

The fern test has been described since 1960s.This test is by placing a swab in the posterior fornix of vagina to obtain vaginal fluid and then performing a smear on glass slide which should be allowed to dry for 10 minutes. The microscopic appearance of the smear as arborisation or fern pattern is a positive test. The reported specificity of fern test has been reported to be 84-100% (Bennett SJ et al). The fern test gives 4.8% false negative and 4.4%false positive results (Tricomi et al).

ULTRASOUND

Patients with leakage of fluid from vagina may also have a sonographic evaluation of amniotic fluid volume performed. It is also important to assess the

gestational age of the pregnancy, fetal heart rate, and

the position of fetus. A finding of oligohydromnias may be useful in confirming rupture of fetal membranes along with the above tests. The cervix can also be assessed by measuring the dilatation of cervical os, the cervical length, and to determine if funneling is present.

FETAL FIBRINONECTIN

Another test that may be useful to assess leakage of fluid is fetal fibrinonectin(FFN). Fetal fibrinonectin is a large molecular weight glycoprotein present in large quantities in amniotic fluid. It can be detected in endocervix or the vagina in 93.8% of women with PROM by means of ELISA. This test can be performed after 18 weeks of gestation. A negative test indicates that the membranes are intact since its negative predictive value is 98-99%. Nevertheless, it has a poor positive predictive value due to its high false positive rate and may not be cost effective. Meconium may interfere with results (Lockwood et al).

DYE TEST

If the diagnosis of rupture of fetal membranes cannot be made with the above tests, an ultrasound guided invasive test can be performed. A 22 gauge needle is inserted under ultrasound guidance into amniotic cavity. Amniotic fluid can be obtained and evaluated for glucose, white blood cells,

gram stain, and be sent for culture of amniotic fluid. Indigo carmine or Evans blue (1ml)

can be instilled. A tampon is placed in the vagina prior to instillation of dye and kept in place for 30-60 minutes, when removed, a blue tinged tampon will be seen if the patient has ruptured membranes.

ALPHA FETOPROTEIN

Alpha fetoprotein (AFP) is present in high concentration in the amniotic fluid but does not exist in vaginal secretions or in the urine. Therefore, determination of this substance in the vaginal secretions is an accurate test for diagnoses of PROM. A study using a rapid colorimetric monoclonal antibody AFP test found a sensitivity of 98% for AFP, 77% for nitrazine, and 62% for ferning. Specificity was 100% for the AFP test (Rochelson et al). The test may be unreliable at term because amniotic fluid AFP decreases with gestational age. Also, maternal blood contamination affects the accuracy of the test.

AMNISURE

A new generation test that uses immunochromatographic method(Amnisure) to detect trace amounts of placental microglobulin -1(PAMG-1) has been found to be highly diagnostic with a sensitivity of 99% and specificity of 100%(Cousins LM et al). PAMG-1 is a protein produced by the cells of the decidual part of the placenta which can be detected in the

amniotic fluid after the rupture of membranes. The test can be performed using a kit in 5-10 minutes.

NEONATAL COMPLICATIONS OF PPROM

HYALINE MEMBRANE DISEASE

HMD (Hyaline Membrane Disease) is the greatest threat to the newborn when PROM occurs before term. At 22 weeks, 100% of the newborn will have respiratory distress syndrome. At 28 weeks, the incidence of RDS it 85%, at 32 weeks is 25%, and at 34 weeks is close to 10%. The National Neonatal Database gives an incidence of RDS of 100% at 24 weeks, 97.8% at 27-28 weeks, 58.1% at 31-32 weeks, and 30.9% at 33-34 weeks. The data are consistent and the differences are probably due to variations in the population being studied. From this, it seems clear that expectant management to improve fetal pulmonary maturity should dominate other consideration before 36 weeks.

INFECTION

The incidence of sepsis is 36.4%, 24.4%, 1.6%, and 0.8% at 24 weeks, 27-28 weeks, 31-32weeks and 33-34weeks respectively. The infection is an important consideration before 28 weeks. The neonatal morbidity for mid-trimester PPROM is 35-40%, in the majority of cases this occurs secondary to infection. Infection decreases the latency period

resulting in deliveries at a premature gestational age. Some studies have compared the neonatal mortality of those delivered after mid trimester PPROM and controls delivered without PPROM having the same gestational age. There was no difference in mortality rate between the groups, indicating that the main factor for neonatal morbidity is extreme prematurity secondary to a decrease in latency period (Kurkinen-Raty M, Koivisto , Jouppila et al).

PRETERM

Prematurity is the most significant factor in the increased perinatal mortality and morbidity associated with preterm rupture of membranes, because delivery occurs within 7 days of PPROM in 80% of cases (Taylor J, Garite TJ et al).

MUSCULOSKELETAL MORBIDITIES

Majority of fetal limb growth occurs in the second and third trimester of pregnancy. If chronic oligohydramnios is present after mid-trimester PPROM, fetal growth and movements are restricted, and the intrauterine pressure becomes asymmetric leading to limb position deformities, pulmonary hypoplasia, and craniofacial defects. In mid-trimester PPROM, the reported incidence for these deformities varies between 3.5-50% for cases with severe oligohydramnios (Moretti M, Sibai BM. et al). The risk increases when the duration of PPROM is greater than 14 days (Killbride HW, Yeast JI, Thibeault DW et al).

INTRA UTERINE FETAL DEMISE

The incidence of intra-uterine fetal demise after mid trimester PPROM varies, but the risk has been reported to be about 9.8%. The rate is proportional to gestational age when PROM occurs, decreasing as gestational age increases (Blott M, Greenough et al, Major CA, Kitzmiller JL et al).

PULMONARY HYPOPLASIA

Pulmonary hypoplasia is associated with PPROM occurring prior to 26 weeks of gestation. The incidence of pulmonary hypoplasia if PPROM occurs after 26 weeks is low (1.4%) (Falk SJ, Campbell LJ, Lee Paritz A et al; Nimrod C, Varela Gittings FI, Machin G et al). The incidence of pulmonary hypoplasia as a complication of mid trimester PPROM varies depending on the gestational age of pregnancy. Rotschild et al reported an incidence of pulmonary hypoplasia when PPROM occurred at 19 weeks is 50% and at 25 weeks is 10%. In 1994 Vergani et al described an association between severe oligohydramnios and pulmonary hypoplasia. In the study, all the fetuses that had pulmonary hypoplasia were born to mothers with a

median amniotic fluid of less than 2 cm. It is thought that when PPROM occurs, the pressure gradient between the amniotic cavity and the alveoli is altered leading to a loss of fetal lung fluid to the amniotic cavity, leading to this complication. Oligohydramnios, particularly if there is prolonged PPROM, may result in neonatal "oligohydramnios tetrad" of facial anomalies, limb position defects , pulmonary hypoplasia, and impaired fetal growth, all of which add to neonatal morbidity.

MATERNAL COMPLICATIONS

The maternal complications most frequently associated with PPROM are acute chorioamnionitis, subclinical chorioamnionitis, premature placental separation and post partum endometritis.

ACUTE CHORIOAMNIONITIS

The diagnosis of chorioamnionitis is clinical. It requires the presence of fever

(>100F or 37.8°C) and at least two of the following conditions:

Maternal tachycardia (>100bpm)

Fetal tachycardia (>160bpm)

Uterine tenderness

Foul smelling vaginal discharge

Maternal leucocytosis(>15000 /cubic mm)

C-reactive protein >2.7 mg/dl

(Gibbs et al, 1982). Amniocentesis is not necessary for the diagnosis of acute chorioamnionitis.

The risk of acute chorioamnionitis is inversely related to gestational age at the time of rupture of the membranes. Beydoun and Yasin (1986) found an incidence of chorioamnionitis of 58.6% in patients with PROM before 28 weeks. This is in contrast with an incidence of less than 10% when PROM occurs after 36 weeks. The high incidence of acute chorioamnionitis and neonatal infection when PROM occurs in pregnancies remote from term may be related to decreased antibacterial activity of amniotic fluid (Schlievert et al, Blanco et al.,). The antibacterial activity of the fluid is low in early pregnancy and increases with gestational age. Another factor is the immaturity of the fetal immunological system that limits the ability of the preterm infants to fight infection.

Acute chorioamnionitis may be apparent at the time of admission. It may also

develop during the latency period in women who are not infected during the time of admission. In these cases, the incidence of infection is related to the duration of latency period. Butchers (1964) found that 1.7% of his patients with PROM developed fever within 24 hours, 7.5% between 25-48hours and 8.6% beyond 48 hours. Histologic chorioamnionitis is found in 10% of the patients 12 hours after rupture of the membranes, in 30% after 24

hours, in 45% after 48 hours, and in 48% after 72 hours (Naeye and Peters et al.,). Other investigators (Ghidini et al.,) have found that the incidence of histologic chorioamnionitis does not increase with the duration of latency period. Internal fetal monitoring is another factor that predisposes to chorioamniotic infection. Newton et al determined by logistic regression analysis that the chance of developing chorioamnionitis was 20% for patients who had 20 hours of PROM and 3 hours of internal fetal monitoring. This probability increased to 40% if the latency period was greater than 20 hours and internal fetal monitoring lasted 12 or more hours.

SUBCLINICAL CHORIOAMNIONITIS

Romero et al demonstrated by means of bacteriologic studies of amniotic fluid that approximately 40% of patients with PPROM are infected at the time of admission but only a minority of them had signs and symptoms of overt infection. On many occasion, the only symptom of chorioamniotic infection is uterine contractions. Other signs of subclinical infections are a change from a reactive to nonreactive pattern in NST and absence of respiratory movement in biophysical profile. Desai DR from Belguam, India

reported that C-reactive protein estimation was superior to urine culture, cervical swab culture, placental culture, and histology in detecting subclinical infection in cases of PROM.

PLACENTAL SEPARATION

Patients with PROM have an incidence of abruptio placentae of approximately 6% which is significantly higher than the 1 in 150 found in patient with intact membranes (Vintzileos et al., 1987). Abruption usually occurs within the setting of prolonged and severe oligohydramnios. The clinical picture is that of mild to moderate vaginal bleeding and preterm labour. Usually abruption is not severe enough to cause fetal demise or disseminated intravascular coagulation. The reason for the high incidence of abruption in patient with PROM is a progressive decrease in intrauterine surface area, causing detachment of placenta. Mukherjee reported a high incidence of 30% in women with preterm labour and PROM suffering from antepartum hemorrhage.

POSTPARTUM ENDOMETRITIS

Postpartum endometritis is the most common maternal complication of mid trimester PPROM, particularly if they develop chorioamnionitis and are delivered by cesarean section. The incidence has been reported to be between 15-60%. Nevertheless, the incidence of postpartum maternal sepsis has been reported to be between 0-3% (Shumway JB Al- Malt A, Amon E et al).

MANAGEMENT

INITIAL ASSESSMENT

The main objectives of the initial assessment are to confirm the diagnosis of PROM, to determine the gestational age of the fetus, and to identify the women who need to be delivered. Secondary objectives will be to determine fetal pulmonary maturity and to identify subjects colonised with Chlamydia, N.gonorrrhea, and GBS.

Digital pelvic examination is not a part of assessment of women with PROM unless they are in active labor as defined by the frequency and intensity of uterine contractions. It has been demonstrated that digital examination causes a significant decrease in the duration of the latency period (Alexander et al).

Gestational age(weeks)

Latency period

Digital examination

No digital examination

24-26

1.6±0.7

20.5+19.8

26-28

3.8±5.3

13.9+14.1

28-30

2.1±2.9

14.2+13.3

30-32

1.5±0.8

6.7+6.8

32-34

2.2±5.7

5.5+5.8

34-36

1.2±0.5

5.8+3.6

Courtesy Lewis DF, Mazor CA, Towers CV, et al

SPECULUM EXAMINATION

The initial assessment of women with PPROM includes, in addition to the history and physical examination, a sterile speculum examination. The speculum examination is necessary to confirm the diagnosis of PPROM, to obtain amniotic fluid for determination of fetal pulmonary maturity and to obtain samples from endocervix. It also helps in assessing the dilatation and length of cervix. Before speculum examination vaginal swab is taken. Fern test and Nitrazine test are also performed for confirming PPROM.

LABORATORY ASSESSMENT

The initial laboratory assessment should include a complete blood count, to

determine the total number of white blood cells, a differential count, and determination of C-reactive protein (CRP).

ULTRASOUND EXAMINATION

Ultrasound examination is done to confirm or determine the fetal position, measurement of amniotic fluid volume, fetal biometry for estimation of gestational age and fetal weight, and cervical length by trans vaginal ultrasound.

GESTATIONAL AGE DETERMINATION

The duration of latency period, the management of patient and the fetal and neonatal prognosis are heavily dependent on gestational age at the

time of PROM. Therefore, a precise assessment of gestational age is an important part of initial evaluation of women with PPROM. An ultrasound examination in the first trimester of pregnancy is extremely accurate in estimation of gestational age (Wiser et al.,). Similarly, an ultrasound derived gestational age in the second trimester of pregnancy that does not differ by more than 7 days from the estimate based on last menstrual period confirms the diagnosis of gestational age. If the ultrasound derived and the LMP derived estimations of gestational age differ by more than 7 days, the ultrasound derived value is the most accurate and should be adopted for clinical management (Chevenak et al.,). It is important to consider that the lack of fluid affects the accuracy of ultrasound measurements and the gestational age is frequently underestimated (O'Keefe et al.,).

After initial assessment, the next step is to identify the women requiring

immediate delivery. The indication may be maternal or fetal. These indications are

1. women in advanced labor
2. evidence of acute chorioamnionitis
3. evidence of subclinical infection/inflammation
4. women at high risk for severe infection
5. fetuses with mature lung
6.
7. fetuses with non reassuring well being test
8. fetuses with lethal abnormalities.

The management of PPROM is dictated by the gestational age at the time of its occurrence. This is due to variation in the incidence of fetal/neonatal complications at different gestational age.

PROM AT 36 WEEKS

Women with PROM after 36 completed weeks should be delivered. There is little gained by conservative management when the pregnancy has advanced to a stage at which fetal pulmonary maturity is complete or almost complete and the incidence of RDS is minimal.

PPROM BETWEEN 32 AND 36 WEEKS

Approximately 50% of the fetuses of women with PPROM between 32 and 36 weeks of gestation will have adequate lung maturity. The issue of fetal lung maturity is important in the management of PPROM between 32 and 36 weeks, a decisive effort is

made to collect amniotic fluid for lung maturity testing. If the fetal lungs are mature active intervention is recommended (Spinnato et al, Mercer et al1993).

The management of women between 32 and 36 weeks with PPROM is matter of discussion among experts. There are several studies favouring induction (Naef et al, Mercer et al1993). Expectant management with

antibiotics and steroids decreases the incidence of RDS, which is the most frequent neonatal morbidity in this group (Neerhoff et al, Mercer et al 1997).

The care of these patients should be individualized. Immediate delivery by induction may be the best options under certain circumstances like chorioamnionitis, oligohydromnios, non reassuring fetal heart, active labour and transverse lie. The women should remain in hospital until delivery. Antibiotics should be given intravenously for 48-72 hours followed by oral treatment for 5-7days. Electronic fetal monitoring should be performed daily. Patients should be assessed daily for fever, maternal or fetal tachycardia, uterine tenderness, and foul smelling discharge. The effect of glucocorticoids in preventing RDS in women with PPROM between 32-36 weeks is controversial. Similarly incidence of IVH is rare after 32 weeks.

PPROM BETWEEN 24 AND 32 WEEKS

The risks threatening the fetus affected by PPROM between 24 and 32 weeks are multiple. The predominant risk is RDS usually due to HMD, affecting 30-100%. Other frequent morbidities are sepsis affecting from 10- 50%; IVH affecting between 5 and 50%; necrotizing enterocolitis affecting 1-10%; and chronic lung disease affecting

between 2 and 80%. All of these complications are directly related to gestational age at the time of birth and are more frequent and severe when pregnancy is less than 28 weeks.

The obstetrical management of women with PPROM between 24 and 32 weeks should be directed towards prolongation of the latency period, prevention of RDS and IVH, and prevention of fetal/neonatal and maternal infectious morbidity. These are achieved through the use of antibiotics, steroids and tocolytic agents. Women with PPROM between 24 and 32 weeks should be admitted to the hospital and remain as inpatients until delivery. They should be on bed rest with bathroom privileges.

PPROM BEFORE 24 WEEKS

The perinatal outcome of PPROM before 24 weeks of gestation is poor. 48% of these patients will deliver within 3 days, 67% within 1week, and 83% within 2 weeks of PPROM (Moretti and sibai et al). Perinatal mortality is 60-90%. Approximately 50% of mothers will have chorioamnionitis, 50% will be delivered by cesarean section, and 6.8% will have abruption. 16% of the surviving newborn has severe long term sequelae. Most of the survivors are patients who extend their latent period for 2 or more weeks. Some patients have pregnancy prolonged for several weeks after PPROM without evidence of infection with little or no liquor amnii. They are at high risk for musculoskeletal deformities and pulmonary hypoplasia. Deformities usually appear after 4 or more weeks of PPROM.

If the pregnancy is less than 24 weeks the mother should be offered induction of labour and delivery of the fetus to avoid morbidity. If the patient chooses termination it should be made clear that there is 10-20% probability that the fetus will be born alive. If the mother declines termination and chooses expectant management, she will be treated with tocolytics, glucocorticoids, and antibiotics. If the patient is less than 24 weeks she may be sent home and readmitted in hospital for further expectant management after she completes 24 weeks.

TOCOLYTICS IN PPROM

PPROM is a major cause of preterm deliveries and perinatal morbidity; hence the use of tocolysis may be appealing to the obstetrician. However, tocolytic use in case of PPROM is controversial. Several randomized controlled studies have been done looking at oral tocolytics in PPROM, intravenous tocolytics, and short term and long term tocolysis(Mastuda Y et al, Levy DL et al). All these studies failed to show decreased perinatal morbidity or improvement in neonatal outcome. Also, the use of tocolytics may be of concern since the incidence of perinatal infection is high and prolongation of these pregnancies is not desired. However, they may be useful in women with contractions at the time of admission who may deliver before receiving the benefit of glucocorticoid

administration. Aggressive tocolysis after PPROM does not prolong the pregnancy or reduce neonatal mortality more than a limited treatment for a few days (Combs et al).

ROLE OF ANTENATAL CORTICOSTEROIDS

The use of antenatal corticosteroids is controversial in a pregnancy complicated by PPROM. Prospective, randomized, control studies have not shown a decrease in rate or severity of RDS in patients receiving antenatal corticosteroids (Morales wet al, Block MF et al.). These studies also showed a small increase in postpartum endometritis and

neonatal infections.

In 1994, the National institute of Health consensus conference recommended the use of antenatal corticosteroids for those patients who were ≤32 weeks of gestation. This recommendation was made because there was a decrease in IVH and cerebral palsy. Since 1998, the American college of Obstetricians and Gynaecologist (ACOG) recommends the use of corticosteroids to gravidas with PPROM before 32 weeks of gestation without the evidence of chorioamnionitis to decrease the incidence of RDS IVH, NEC and neonatal death (ACOG Practice Bulletin). This decision was prompted by a study by Lewis et al, where 18% (corticosteroid treated) to 44% (untreated) of infants had respiratory distress with no obvious increased risk for infection (5% to 3%). Although corticosteroid may potentially

increase the risk of perinatal infection, they should be administered to patients with PPROM of less than 32 weeks of gestation, since the neonatal benefits may outweigh the risk.

ANTIBIOTIC PROPHYLAXIS

The purpose of prophylactic antibiotics for patients with PPROM is to decrease the risk of perinatal infections and to increase the latency period. A few randomized control studies have shown a prolongation of the latency period of 5-7 days, and a decrease in the incidence of postpartum endometritis and neonatal sepsis (Amon et al, Lovett et al). Prolongation of the latency period is important because FLM improves with advancing gestational age, resulting in fewer days in the ventilator and shorter stay

in the NICU. It has been calculated that every day that the preterm fetus remains inside of the uterus is equivalent to 2-3 days less that the neonate will stay in NICU.

Incidence of severe IVH, neonatal sepsis, pneumonia, and necrotizing enterocolitis are reduced with the use of ampicillin or erythromycin (NIH Maternal Fetal Collaborative Group and the Oracle I Randomised Trial). No effect of antibiotics has been demonstrated with respect to respiratory distress syndrome. Several antibiotics are used in these trials, including ampicillin IV plus amoxillin orally for 7 days. Cephalexin IV until delivery, Piperacillin IV for 72 hours, ampicillin/gentamycin/clindamycin IV for 24 hrs plus ampicillin/clavulanate orally for 7 days, ampicillin/sulbactam IV for 48hrs plus ampicillin/clavulanate orally for 5-7 days, ampicillin/erythromycin IV for 48 hrs plus amoxycillin/erythromycin orally until delivery. Administration of ampicillin/sulbactam has been associated with higher incidence of necrotizing enterocolitis(Kenyon et al).

There is no evidence to recommend a particular duration of antibiotic therapy. It is important that antibiotics are effective against GBS and E.coli. Azithromycin is added if chlamydia is present in culture and Rocephin if N.gonorrhoea is present. A commonly used regimen is cefazolin 2 g IV every 8 hrs for 48 hrs followed by cephalexin 250 mg orally for 5 days. Recent evidence suggested the results are similar with or without oral therapy (Segel et al, Svena et al).

SURGICAL APPROACHES TO THE TREATMENT OF PPROM

The site of rupture can be visualized endoscopically (Quintero et al 1998). The

site is usually located above the internal cervical os in case of spontaneous rupture while in traumatic rupture, following amniocentesis, or fetal surgery, the site is far from the cervix. Shortly after rupture, the slit in

the membranes has clean, sharp edges that become irregular with the passage of time.

Various experimental approaches have been used to seal the site of rupture. The first attempts were made using fibrin glue from mixing thrombin with cryoprecipitate, and then came AMNIOPATCH created by successive intra-amniotic injections of platelets and cryoprecipitate (Quintero et al 1999). This method is not useful in spontaneous rupture. Also sudden fetal death may occur in some cases most probably because of release of substances toxic to the fetus by the activated platelets. Transcervical application of commercial fibrin tissue sealant made up of cryoprecipitate and thrombin has been tried (Sciscione et al). Another potential surgical treatment for PROM is use of gelatin sponge embolisation(O'Brien et al).

SPECIAL SITUATIONS IN WOMEN WITH PPROM

PPROM WITH CERVICAL CERCLAGE IN SITU

PPROM occurs in 30-50% of cases of rescue cerclage and in about 5-10% of cases of prophylactic cerclage. When PPROM occurs in pregnancies at >34 weeks, there are no substantial advantages of prolongation of pregnancy and cerclage should be removed and labour induced if there is no spontaneous labour within 24-48 hours. In most of these cases cerclage

removal is followed by spontaneous labour and delivery. The management problem

occurs when PPROM occurs far from term in a woman with cerclage “in situ’’ because the literature in the era before antibiotic treatment for PPROM strongly suggested that incidence of infection was greater when the cerclage remained “in situ” than when it was removed(Ludmir et al).The contemporary treatment with antibiotics of women with PROM has modified the outcome of these patients, and most of the recent literature suggests that cerclage should not be removed (Jenkins at al., ,McElrath et al.). If the cerclage is left “in situ” and the mother is treated with antibiotics, the latency period will be prolonged without significant increases in fetal/ neonatal morbidity and mortality. Exceptions will be cases with overt choriamnionitis , active labour, or non reassuring fetal status.

PPROM IN MULTIFETAL PREGNANCIES

PPROM occurs more frequently in twin than singleton gestations (7.4% versus 3.7%) (Mecer et al). The reported mean gestational age at which PPROM occurs in multifetal gestations is 30 weeks. When compared to a singleton pregnancy with PPROM matched for gestational age, the event occurring in multifetal pregnancies has a shorter latency period (Bianco AT et al., Jacquemyn Y et al).

When PPROM occurs in a twin pregnancy, the ruptured sac can be from presenting fetus, from the sac of the non presenting fetus, or from the interamnionic membrane. When PPROM occurs from the sac of the presenting fetus, the non presenting fetus has an increased incidence of RDS as well as prolonged oxygen therapy. There are few

cases reported on the management of PPROM when occurring from the nonpresenting twin.

If PPROM occurs early in the second trimester, termination of the pregnancy should be offered, since the risk of continuing the pregnancy outweighs the benefit of expectant management. Delayed interval delivery of the presenting twin after PPROM may be an option in selected cases. Contraindications to offer this option to a patient are suspected placental abruption, intra-amnion infection, and non reassuring fetal status. A monochorionic placenta is a relative contraindication. The management of delayed interval delivery is ligation of umbilical cord with an absorbable suture after vaginal delivery, followed by tocolytics and antimicrobials. The placement of cerclage is controversial.

HERPES GENITALIS AND PPROM

If a mother has PPROM with active genital lesions, chance of perinatal transmission is present. It is necessary to balance the benefits of prolongation of pregnancy against the possibility of ascending fetal

infection. Delivery by cesarean is the best mode if pregnancy is beyond 34 weeks. In pregnancy less than 34 weeks , there is limited evidence indicating that expectant management is adequate, and fetus do not become infected with HSV if the latency period is prolonged (Major et al.).

HIV AND PPROM

A major risk factor for vertical transmission of HlV is the duration of ruptured

membranes prior to delivery. There is a significant increase in vertical transmission rate if duration of rupture of membranes was greater than 4 hrs in patient with low CD4 levels. (Minkoff et al). Other studies confirmed that among HIV infected pregnant women, ruptured membranes greater than 4 hrs prior to delivery significantly increased the rate of vertical transmission from 25% as compared to 14% among mothers with a shorter length of ruptured membranes (Landesman SH et al.,).

AIM OF THE STUDY

AIM

- To compare active versus expectant management in women with preterm premature rupture of membranes between 34 and 37 weeks.
- To compare the maternal morbidity in active versus expectant management.
- To critically evaluate the neonatal outcome in both mode of management

MATERIALS AND METHODS

MATERIALS AND METHODS

The prospective study was carried out in the Department of Obstetrics and Gynaecology Government RSRM Lying-in Hospital attached to Stanley Medical College, Chennai during the period of one year from October 2008 to September 2009.154 cases satisfying the criteria were clinically evaluated and followed up.

The study group consists of pregnant women with preterm premature rupture of membranes with gestational age between 34 weeks 0 days to 36 weeks 6 days.

INCLUSION CRITERIA

Pregnant women between 34 to 37 weeks of gestation with

a. PPROM
b. Singleton with vertex or breech presentation
c. Multiple pregnancy with 1st twin in vertex presentation
d. Previous LSCS

EXCLUSION CRITERIA

a. Twin pregnancy with non vertex presentation.
b. Major congenital anomalies
c. Non reassuring fetal heart rate in CTG.
d. Active labour.
e.
f. Meconium stained amniotic fluid
g. HELLP syndrome or severe pre ecclampsia.

h. Signs of infection in mother and fetus

i. Severe oligohydromnios

j. Other obstetrics and medical complications

All patients between 34 and 37 weeks who reported with a history of PPROM, was confirmed by sterile speculum examination/nitrazine test/fern test.

The gestational age was ascertained by LMP and first trimester dating ultrasound. If the disparity between LMP and USG based gestational age was more than 7 days then gestational age was assumed as per USG.

The pregnant women were admitted and all baseline investigations like Hb, urine albumin and sugar, blood sugar, blood grouping and typing, HIV and VDRL were done. High vaginal swab was taken for culture and sensitivity.

Maternal temperature, pulse, blood pressure and fetal heart rate were recorded. Non stress test was done.

A sterile pelvic examination was done to assess the initial bishop score. Further digital examinations were prohibited.

EXPECTANT MANAGEMENT

Patient who were managed expectantly were observed in labour room for the initial period with continuous external fetal heart rate monitoring and tocodynamometry. In the absence of non reassuring fetal status, initiation of labour and absence of infection, these patients were transferred to an antepartum room where the maternal

vitals and FHR were monitored periodically.

The women were advised bed rest. In our hospital IV ampicillin 2 gms every 8 hrs for 48hrs given followed by oral amoxycillin for 7 days or until patient goes into labour.

Daily modified biophysical profile was carried out. Delivery was either by spontaneous onset of labour or when termination is indicated by the non reassuring fetal heart rate, or signs of chorioamnionitis, or with the development of oligohydramnios.

Cesarean delivery is indicated for obstetric indications. Acceleration of labour was done by oxytocin.

ACTIVE MANAGEMENT

In patients managed actively, labour was induced by either oxytocin continuous infusion or intracervical instillation of PgE2 gel. Cesarean section was indicated for obstetric indication.

Oxytocin was administered by continuous infusion starting with 5mu/min and doubling the dose until a satisfactory labour pattern is established.

0.5 mg of PgE2 gel is instilled intracervically and assessment of bishop's score was done after 6 hrs followed by oxytocin acceleration.In either case labour is monitored carefully using a partogram. Cesarean was indicated for obstetric reasons.

Clinical chorioamnionitis was defined, by a temperature of >100.4F with uterine tenderness, leucocytosis, maternal or fetal tachycardia, or a foul smelling vaginal

discharge. All patients with chorioamnionitis received intravenous ampicillin and gentamycin, regardless of group assignment ,and the antibiotic therapy was continued until the patient was afebrile for 48 hours post partum.

The infants are managed by pediatrician. Intrapartum maternal hyperpyrexia or clinical findings suggestive of neonatal infection resulted in admission to the neonatal intensive care unit for sepsis evaluation. The diagnosis of neonatal sepsis was made in infants with positive blood cultures. However, all the babies with suspected sepsis received empirical broad spectrum antibiotics until culture results were negative.

RDS was defined as early onset of tachypnea, retractions, and oxygen requirement for 24hrs, or mechanical ventilation with radiographic confirmation.

The mother was followed post partum, any signs of post partum endometritis like fever greater than 100.4 F with uterine tenderness were watched for, until discharge.

OBSERVATION AND ANALYSIS

OBSERVATION AND ANALYSIS

During the study period, out of the 154 patients 88 were managed actively and 66 were managed expectantly. The statistical analysis of group differences was accomplished with the use of Chi squire test and Fisher's exact test as appropriate for discrete data and the student t test for continuous data. Significant differences were accepted at $p \leq 0.05$. The observed data are tabulated as follows

Table 1: Distribution of age in both categories

	Active		Expectant	
Age in yrs	No	Percentage	No	Percentage
15 - 20	8	9.09%	10	15.15%
21 - 25	56	63.64%	32	48.48%
25 - 30	24	27.27%	18	27.27%
>30	-	-	6	9.09%

In this study, in active management group 63.64% of women belonged to 21-25 yrs of age, 27.27% belonging to 25-30 yrs of age and 9.09% to 15-20 yrs of age. In expectant management group, 48.48% were in 21-25yrs of age, 27.27%in 25-30yrs of age, 15% in 15-20yrs of age, and 9.09% in greater than 30 years of age.

Distribution of maternal age in both categories

Table 2: Distribution of gravidity in both groups

	Active		Expectant	
Obs Code	No	Percentage	No	Percentage
PRIMI	50	56.82%	36	54.55%
G2	28	31.82%	20	30.30%
G3	10	11.36%	10	15.15%

In this study, in both the groups around 55% were primi, 30% were second gravida, and 12% were third gravida. Incidentally gravidity distribution is similar in both the groups.

Distribution of gravidity in both groups

Table 3: Gestational age at PPROM

GA in weeks	Active		Expectant	
	No	Percentage	No	Percentage
34	14	15.91%	26	39.39%
35	20	22.73%	20	30.30%
36	54	61.36%	20	30.30%

In this study in active management group 61.36% belonged to 36 weeks of gestation, 22.73% to 35 weeks, and 15.91% to 34 weeks of gestation. In expectant group 39.39% belong to 34 weeks of gestation, 30.30% to 35 and 36 weeks of gestation each.

Distribution of Gestational age at PPROM in both groups

Table 4: Duration of PPROM at the time of admission

Draining Since	Active		Expectant	
	No	Percentage	No	Percentage
<6	23	26.14%	31	46.97%
6-12	33	37.50%	17	25.76%
12-24	26	29.55%	16	24.24%
24-48	6	6.82%	2	3.03%

When we look at the distribution of the duration of draining at the time of admission in both the groups, in active management group 26.14% had draining of less than 6 hrs,37.50% within 6-12hrs,29.55% within 12-24hrs, 6.82% within 24-48hrs. In expectant management group 46.97% had draining of less than 6 hrs,25.76% within 6-12hrs,24.42% within 12-24 hrs, and 3.03%within 24-48hrs.In this study, in both groups 95% of the patients were admitted within 24 hrs of draining.

Duration of PPROM at the time of admission

Table 5: Mode of induction of labour in active management group

Mode of Onset	Active	
	No	Percentage
PGE2	4	5.79%
Oxytocin	65	94.20%

Out of the 88 patients in active group 63 received oxytocin for induction, 4 were induced with PgE2 gel since bishop's score was less than 4.

Mode of induction of labour-Active group

Table 6: Mode of delivery

Mode of Delivery	Active		Expectant	
	No	Percentage	No	Percentage
C/S	32	36.36%	10	15.15%
LN	56	63.64%	52	78.79%
Outlet	0	0.00%	4	6.06%

In this study, of the 88 patients managed actively 32(36.36%) patients had cesarean section, and 56(63.64%) had labour natural. In expectantly managed patients 10(15.15%) had cesarean section, 52(78.79%) had labour natural, and 4(6.06%) had outlet forceps delivery.

Mode of delivery

Table 7: Comparison of cesarean section in both groups

Mode of Management	No of cesarean	Percentage	Total no of patients
A	32	76.19%	88
E	10	23.81%	66
Total	42	100%	154

P =0.0034

The P value is significant indicating cesarean rate is increased in active group. Out of total cesarean in this study, 76.19% was done in active management group. This increase was because of inclusion of previous LSCS and breech with PPROM.

Table 8: Indications for cesarean

If C/S Ind	Active		Expectant	
	No	Percentage	No	Percentage
Breech	3	9.38%	2	20.00%
FTP	11	34.37%	0	0.00%
MSAF	0	0.00%	4	40.00%
Oligo	0	0.00%	3	30.00%
PreviousLSCS	16	50.00%	0	0.00%
Others	2	6.25%	1	10.00%

In active management group 50% of LSCS is done for previous LSCS with PPROM, 34.37% for failure to progress, 9.38% for breech, and 6.25% for other causes. In expectant management group 40% of LSCS was done for MSAF, 30% for oligohydromnios, 20% for breech and 10% for other causes. Barring previous LSCS as an indication, the rate of cesarean section in active group was 18.18% as against 15.15% in expectant management group. In this study, in active group the cesarean section rate is influenced by inclusion of previous LSCS.

Table 9: Comparison mean of Admission delivery interval in both groups

Variable	Mode of Management	N	Mean	Std Dev	Minimum	Maximum
		8	5.386			
AD_interval	A	86	4 22.27	3.015	1	14
AD_interval	E	6	3	18.311	4	88
AD_interval	Diff (1-2)		-16.89	12.19		

P<0.001

The mean admission delivery interval in active management group is 5.38hrs and in expectant group it is 22.27hrs. By applying equality of variances P<0.001 indicates a significant difference in admission delivery interval in between the groups. It was prolonged by an average of 16.89 hrs in the expectant management group. The short admission delivery interval in active management group was because of early induction of labour.

Table 10: Duration of onset of PPROM to delivery in both groups.

Interval between PPROM and delivery in hrs	Active		Expectant	
	No	Percentage	No	Percentage
< 24	70	79.55%	25	37.88%
24 - 48	18	20.45%	31	46.97%
> 48	0	0.00%	10	15.15%

In this study in active management group,70 (79.55%) delivered within 24 hrs, 18 (20.45%) within 24-28hrs. Of the 18 delivered after 24 hrs, 15 patients were admitted after 24 hrs of PPROM. In expectant management group 24(37.88%) delivered within 24hrs, 31(46.97%) within 24-48 hrs, 10(15.15%) delivered after 48hrs. The increase in the duration of interval between PPROM and delivery in expectant group was due to prolongation of latent period.

Duration of onset of PPROM to delivery in both groups

Table 11: Relationship between GA, latent period and admission delivery interval in expectant group

Gestational age in weeks	Mean Latent period in hrs	Mean admission delivery interval in hrs
34	34.27	24.19
35	22.3	19.2
36	26.75	24.05

The mean latent period and admission delivery interval was 34.27hrs and 24.19hrs, 22.3hrs and 19.2hrs, 26.75hrs and 24.05hrs at 34weeks, 35weeks, and 36weeks respectively. There was a positive correlation between latent period and admission delivery interval. And also lesser the gestational age longer the latent period.

Table 12: Comparison of duration of hospital stay in mother

Days of hospital stay	Active			Expectant			Diff in mean	Diff in std dev	P value
	No	Mean	Std dev	No	Mean	Std dev			
C/S	32	8.22	0.18	10	9.4	0.27	-1.18	-0.09	<0.001
LN	56	3.41	0.46	52	4.15	0.68	-0.74	-0.22	<0.001

The mean duration of hospital stay of mother in cesarean section was 8.22days and 9.4days, in labour natural was 3.41days and 4.15days in active and conservative management respectively. P<0.001 implies significant prolongation of hospital stay in expectant group. This was due to the prolonged admission delivery interval in expectant group.

Table 13: Comparison of mean of birth weight between groups

Variable	Mode_of_Management	N	Mean	Std Dev	Minimum	Maximum
Baby_Wt	A	88	2.496	0.353	1.75	3.2
Baby_Wt	E	66	2.307	0.2815	1.8	3
Baby_Wt	Diff (1-2)		0.189	0.3244		

P=0.056

The average birth weight of infant in active mode of management was 2.496 kg with a standard deviation of 0.353kg. In case of expectant management the average birth weight was 2.307kg with a standard deviation of 0.281kg. There was no significant

difference in birth weight of infants born of both mode of management.

Table 14: Distribution of baby weight

Mode of Management	Baby Weight in kg			Total
	<2	2-2.5	> 2.5	
A	6	42	40	88
E	9	46	12	67
Total	15	88	52	155

In this study, out of 88 babies born in active management 6(6.82%) weighed less than 2 kg, 42(47.73%) weighed between 2-2.5kg, and 40(45.45%) weighed greater than 2.5kg. In the expectant management group out of 67 babies born, 9(18.42%) weighed less than 2kg, 46(68.66%) weighed between 2-2.5kg, and 12(17.91%) weighed greater than 2.5kg.

Distribution of baby weight in both groups

Table15: Comparison of Apgar score in both groups

	Active (no=88)		Expectant (no=67)		Diff in	Diff in	P value
	Mean	Std dev	Mean	Std dev			
					mean	std dev	
Apgar 1’	5.602	1.483	5.298	1.061	0.304	0.422	0.095
Apgar 5’	7.568	0.478	7.477	0.556	0.091	-0.078	0.440

The mean Apgar score at 1 minute was 5.6 and 5.29, at 5 minute was 7.56 and 7.47 in active and expectant management respectively. There was no statistically significant difference in the Apgar score in both mode of management.

Table 16: NICU admission

	Infant admitted in NICU		Infants not admitted	
	No	Percentage	No	Percentage
Active	33	37.50%	55	62.50%
Expectant	23	34.32%	44	65.67%
P=0.684				

In this study, in active group 37.50% of infants were admitted in NICU and in expectant group 34.32% of infants were admitted in NICU. There was a small decrease in NICU admission in expectant management group which was not statistically significant (P=0.684).

Table17: Causes for NICU admission

NICU	Active	Expectant	P value

Admission	No	Percentage	No	Percentage	
Preterm	10	30.30%	5	21.73%	0.416
LBW	4	12.12%	4	17.39%	0.259
BirthAsphyxia	4	12.12%	2	8.69%	0.488
RDS	11	33.33%	4	17.39%	0.140
Sepsis	2	6.06%	6	26.08%	0.067
Others	10	30.30%	5	21.73%	0.416

In this study in the active group out of 33cases admitted in NICU 11(33.33%) for RDS, 10(30.30%) for preterm and borderline term,4 (12.12%) each for LBW and birth asphyxia, and 2(6.06%) for sepsis. In this group 4 preterm, 2 borderline term, 1 LBW neonate had RDS. In the expectant management group, out of 23 patients admitted 5(21.73%) for preterm, 6(26.08%) for sepsis, 4(17.39%) each for LBW and RDS, 2(8.69%) for birth asphyxia, and 5(21.73%) for other reasons like MSAF and jaundice. Incidence of preterm and RDS was high in the active management group. Incidence of sepsis was high in expectant group. These values are not statistically significant as seen from P values. Of the 15 diagnosed with RDS 8 were of 34 weeks of GA, 4 were of 35weeks of GA, and 3 of 36 weeks of GA. This implies that RDS was more common in lower gestational age. Of the 8 diagnosed sepsis, 5 had admission delivery interval

greater than 24 hrs. This implies the significance of latent period and admission delivery interval over the incidence of sepsis.

CAUSES FOR NICU ADMISSION

Table 18: Comparison of days of hospitalization in newborn

Variable	Mode_of_ Management	N	Mean	Std Dev	Minimum	Maximum
DOH newborn	A	88	2.903	0.623	2	5
DOH newborn	E	67	2.782	0.905	1	6
DOH newborn	Diff (1-2)		0.121	-0.282		

P=0.623

The average stay of newborn in NICU was 2.90 and 2.78 in active and expectant mode of management. P=0.623 signifies there was no statistically significant difference in hospital stay in between active and expectant mode of management.

DISCUSSION

DISCUSSION

There was no difference in gravidity distribution in both groups. More than 95% of the women in both groups were admitted to the hospital within 24 hrs of membrane rupture.

Labour ensues within few hours in most cases. Nearly 50% of patients with PPROM go into labour within first 24 hours and 90% within 1 week (Garite et al,Johnson et al,). In present study in expectant group, of the 66 patients, 25(37.88%) delivered within 24 hours, all patients delivered within 4 days. In the work of Neerhof et al only 10% of the women managed expectantly had latency period greater than 48 hours. In present study in expectant management group 12.12% had latency period more than 48 hrs. In actively managed group, of the 88, 70(79.55%) delivered within 24 hours and all the remaining within next 24 hour.

The rate of cesarean section was increased in women managed actively it contributed to 36.36% deliveries in active group against the 15.15% in expectant group. The higher rate of cesarean section in active group was attributed to inclusion of previous LSCS. Barring the cases of previous LSCS, the rate of cesarean section was 18.18% in active group and 15.15% in conservative group. The incidence of cesarean section was similar in both groups in the study by Naef et al.

There were 4 forceps delivery in expectant group as against none in active group.

There was 3 reported chorioamnionitis in expectant management as against none

in active group. Incidence is 4.5%. In the study by Naef et al incidence of chorioamnionitis is 16% in expectant and 2% in active group. The decreased incidence of chorioamnionitis was due to the prophylactic use of antibiotics and nearly 85% of cases delivered within 48 hours in both the groups.

In our study we find prolonged hospital stay in mothers managed expectantly. It was 9.4 days for cesarean and 4.15 days for labour natural in expectant as against 8.22 days and 3.41 days in active management. Mercer et al reported prolonged hospitalization of mothers in women managed expectantly between 32 and 36 weeks.

There were no incidence of placental abruption and puerperal sepsis in both groups.

There was no difference between mean birth weight of babies in both mode of management. It was 2.49 kg in active and 2.3 in expectant group. Mean apgar score at 1' and 5' were 5.6 and 7.56, and 5.29 and 7.47 in active and expectant management respectively. There was no significant difference

in apgar score. The study by Naef et al also showed that Apgar scores at 1 and 5 minutes are identical in both modes of management.

A comparison between neonatal morbidity between Naef et al and the present study is given below

	Respiratory distress		sepsis	
Studies	Active	Expectant	Active	Expectant
Naef et al	5%	5%	0%	5%
Present	12.5%	5.97%	3.40%	9.09%

The RDS was slightly higher in active group. In patient managed expectantly the incidence decreases. The incidence of sepsis was increased in expectant group and this in turn was dependant on the latent period, but this difference was not statistically significant. Mercer et al also reported higher incidence of infectious morbidity in neonates of expectant management group.

The incidence of RDS between 33 and 36 weeks in the national neonatal database was 30%. In a study by Lewis et al of preterm premature rupture of membranes reported 14.9% incidence of RDS at 34 weeks. It was decreased in 35 and 36 weeks. In present study it was 20% in 34 weeks,10% in 35 weeks and 4% in 36 weeks of gestation.

The rate of NICU admission was 37.50% in active group as against 34.32% in the expectant group. The duration of hospital stay was

similar in both groups. Naef et al, in his study said there is no significant difference in hospital stay in both groups. Liemann et al in his study on preterm premature rupture of membranes reported no significant improvement in major and minor neonatal morbidity in fetuses delivered after 34 weeks of gestation managed expectantly.

There was no still birth or neonatal death in both groups in present study.

SUMMARY

SUMMARY

During the one year period of study,154 cases were studied , with 88 in active group and 66 in expectant management.

Admission delivery interval was reduced in active management group and it was prolonged in expectant management group.

Admission delivery interval in turn is dependent on gestational age and latent period in expectant group.

The rate of cesarean section (36.36%)is higher in active management group. But this was influenced by the inclusion of previous LSCS.

There was increased incidence of chorioamnionitis (4.54%) as opposed to nil incidence in active management group.

Maternal hospital stay was prolonged in expectant management group

There was no difference in mean birth weight of babies in both groups.

There was no significant difference in 1 minute and 5 minute apgar score between active and expectant management.

There was a slightly higher incidence of RDS and preterm in the active management group.

Incidence of neonatal sepsis was higher in expectant management group.

There was no statistically significant difference in hospital stay in neonates in both modes of management.

CONCLUSION

CONCLUSION

From this study it is concluded that, active line of management in patients with preterm premature rupture of membranes at 34 weeks 0 days to 36 weeks 6 days of gestation is associated with less chorioamnionitis, and less neonatal infectious morbidities.

In the expectant group, the admission delivery interval is prolonged with increase in the incidence of chorioamnionitis, and neonatal sepsis with prolonged hospital stay. There was slight reduction in RDS, since few days in utero are gained. Overall there is no added benefit in managing patients with PPROM between 34 weeks 0 days to 36 weeks 6 days expectantly.

Hence patients with preterm premature rupture of membranes at 34 to 37 weeks gestation can be considered as candidates for active line of management.

ANNEXURES

PROFORMA

Name:

Age;

Ip no:

Educational status:

Income: occupation:

DoA:

LMP:

EDD:

Scan EDD:

Ht:

Wt:

BMI:

Admitted for

Men h/o:

Mar h/o:

Obs h/o:

Past h/o:

Examination:

Temp:

Pulse:

BP:

CVS:

RS:

Abdomen

Speculam:

Nitrazine paper test:

Fern test;

Vaginal:

Hb:

Total count:

Differential count:

ESR:

Urine alb/sugar:

Bd g/t:

HIV :

VDRL:

High vaginal swab:

USG:

CTG:

Drugs:

Mode of management:

Time of onset of labour:

Mode of onset:

Mode of delivery:

Signs of chorioamnionitis;

If c/s ind:

Baby weight:

Apgar score:

NICU admission if any ind:

Post op/post natal period:

DoD:

ABBREVIATIONS

AFP – Alpha Feto Protein

C/S – Cesarean Section

CRP- C Reactive Protein

FHR – Fetal Heart Rate

FLM

Fetal Lung Maturity

FTP – Failure To Progress

GA –Gestational Age

GBS – Group B Streptococcus

HIV – Human Immynodeficiency Virus

HMD – Hyaline Membrane Disease

HSV- Herpes Simplex Virus

IVH –

Intra Ventricular Hemorrhage

LBW – Low Birth Weight

LMP-Last Menstrual PERIOD

LN – Labour Natural

LSCS – Lower Segment Cesarean Section

MMPs- Matrix MetalloProteinases

MSAF – Meconium Stained Amniotic Fluid

NEC

Necrotising Entero Colitis

NICU- Neonatal Intensive Care Unit

PPROM - Preterm Premature Rupture of Membranes

PROM- Preterm rupture of membranes

RDS – Respiratory Distress Syndrome

USG – UltraSonoGram

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